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# Selected Speeches and News Releases

August 17 - August 24, 1989

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# News Releases

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## USDA BEGINS COOPERATIVE MEDFLY ERADICATION EFFORT IN CALIFORNIA

WASHINGTON, Aug. 17—The U.S. Department of Agriculture has begun efforts to eradicate the Mediterranean fruit fly from Los Angeles County, Calif. The discovery of 40 adult Medflies and 40 larvae in a 3-square-mile area of the county in the last 3 weeks prompted the action.

"If the Mediterranean fruit fly became established in California, the citrus industry in that state alone would suffer more than \$150 million in losses each year," said Larry B. Slagle, acting administrator of USDA's Animal and Plant Health Inspection Service. "The finding of Medflies on several properties in Los Angeles County prompts us to take action against this serious pest."

The Medfly is one of the most destructive pests of fruits and vegetables existing today. Female Medflies lay eggs inside ripe fruit and vegetables, and the developing larvae feed on the pulp of these plant hosts and destroy their commercial and nutritive values.

"Our effort to eradicate the Medfly from California focuses on canceling the Medfly's ability to reproduce," Slagle said. Sexually sterilized Medflies, reared in a special facility in Hawaii, will be released for at least two of the fly's life cycles.

"By releasing large numbers of sterile flies, we eliminate the possibility of two fertile Medflies mating, so the pest literally breeds itself out of existence," Slagle explained. The aerial fly dispersal is scheduled to begin Aug. 21.

In addition to APHIS' sterile fly release, the California Department of Food and Agriculture applied a malathion bait spray to 14 square miles surrounding Medfly-infested areas on Aug. 10. This procedure, which reduces the number of flies, makes the sterile-fly release more effective by giving the sterile flies a mating advantage.

The APHIS-CDFA eradication effort also involves intense trapping activities and a quarantine on the movement of fruits and vegetables out of the specified area. According to Slagle, program personnel have placed almost 2,000 traps baited with sex lures throughout the quarantined area, and are checking the traps weekly.

The quarantine, which encompasses a 70-square-mile area surrounding Dodger Stadium in Los Angeles County, restricts the movement of all fruits and vegetables leaving the quarantined area.

The Medfly originated in West Africa and now exists in Europe, Asia, Africa, and South and Central America. Small infestations of Medflies have been found in the continental United States 14 times in the last 60 years, and each of these was eradicated. The last infestation was detected in Los Angeles County in July 1988, and was eradicated in June 1989.

Janna Evans (301) 436-7251

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## **USDA ANNOUNCES PREVAILING WORLD MARKET PRICE FOR UPLAND COTTON**

**WASHINGTON**, Aug. 17—Under Secretary of Agriculture Richard T. Crowder today announced the prevailing world market price, adjusted to U.S. quality and location (adjusted world price), for Strict Low Middling (SLM) 1-1/16 inch (micronaire 3.5-4.9) upland cotton (base quality) and the coarse count adjustment in effect from 12:01 a.m. Friday, Aug. 18, through midnight Thursday, Aug. 24.

Since the adjusted world price (AWP) is above the 1987, 1988 and 1989 crop base quality loan rates of 52.25, 51.80 and 50.00 cents per pound, respectively, the loan repayment rates for the 1987, 1988 and 1989 crops of upland cotton during this period are equal to the respective loan rates for the specific quality and location.

The AWP will continue to be used to determine the value of upland cotton that is obtained in exchange for commodity certificates. Because the AWP in effect is above the established loan rate, loan deficiency payments are not available for 1989-crop upland cotton sold during this period.

Based on data for the week ending Aug. 17, the AWP for upland cotton and the coarse count adjustment are determined as follows:

**Adjusted World Price**

Northern Europe Price ..... 82.19

**Adjustments:**

Average U.S. spot market location ..... 12.01

SLM 1-1/16 inch cotton ..... 2.20

Average U.S. location ..... 0.39

Sum of Adjustments ..... -14.60

**ADJUSTED WORLD PRICE** ..... 67.59 cents/lb.

**Coarse Count Adjustment**

Northern Europe Price ..... 82.19

Northern Europe Coarse Count Price ..... -78.01

4.18

Adjustment to SLM 1-inch cotton ..... -4.75

-0.57

**COARSE COUNT ADJUSTMENT** ..... 0 cents/lb.

The next AWP and coarse count adjustment announcement will be made on Aug. 24.

Charles Cunningham (202) 447-7954

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**USDA PROHIBITS ENTRY OF OSTRICHES AND OTHER FLIGHTLESS BIRDS**

WASHINGTON, Aug. 18—The U.S. Department of Agriculture today announced that, effective immediately, it is prohibiting the importation of ostriches and other flightless birds into the United States to prevent introducing harmful parasites to U.S. livestock.

“Certain parasites, such as ticks, can carry diseases from one animal host to another,” said Larry B. Slagle, acting administrator of USDA’s Animal and Plant Health Inspection Service. “We must curtail the entry of flightless birds into the United States until further notice to ensure that these birds do not introduce disease-carrying parasites to U.S. livestock.” Flightless birds, known as ratites, include emus, rheas and cassowaries, as well as ostriches.

According to Slagle, the action was prompted by the recent find of 18 exotic ticks on adult ostriches in Ohio, Oklahoma and Texas. The ticks,

identified as African Bont and Bont-legged ticks, are known to transmit heartwater, an often fatal disease of cattle, sheep, goats and other ruminants. The disease, which does not affect humans, does not exist in the United States.

"We are reviewing our inspection and quarantine measures and data on how ticks spread disease to determine if it's possible to import these flightless birds and still protect U.S. livestock against these pests," Slagle said.

The rule will be published in the Aug. 21 Federal Register. Written comments will be accepted if they are received on or before Oct. 20. An original and three copies of written comments referring to Docket No. 89-123 should be sent to Chief, Regulatory Analysis and Development, PPD, APHIS, USDA, Room 866, Federal Building, 6505 Belcrest Road, Hyattsville, Md., 20782.

Comments may be inspected at USDA, Rm. 1141-S, 14th Street and Independence Avenue, S.W., Washington, D.C., between 8 a.m. and 4:30 p.m., Monday through Friday, except holidays.

Janna Evans (301) 436-7251

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## MIKSCHE TO COORDINATE USDA PLANT GENOME PROJECT

WASHINGTON, Aug. 18—A U.S. Department of Agriculture plant scientist, Jerome P. Miksche, will head USDA's Plant Genome Mapping Project, a new research effort to locate the genes controlling key traits in food and forest crops.

Miksche, who has pursued research in plant development and genetics, is national program leader for plant physiology with USDA's Agricultural Research Service. ARS has been designated as the lead federal agency in directing and coordinating the genome mapping project.

Charles E. Hess, assistant secretary for science and education, said the project will be the "first major national effort to do plant genome mapping." He said the research will involve federal agencies, universities and private industry.

Genome mapping develops a comprehensive picture of what genes are present in plants, their arrangement within the chromosomes, what traits they control and how they may do it.

Miksche and Machi Dilworth of USDA's Cooperative State Research Service will co-chair a plant genome coordinating committee. It will begin determining which genes and traits of important agronomic species should have priority, Hess said. Among the traits to be considered will be improved yield, disease resistance and drought tolerance for the selected crops.

Hess said the committee will "ensure planning, cooperation and input from the public and private sectors of the scientific community."

Miksche came to ARS from North Carolina State University where he was head of the botany department. He also served on the North Carolina Board of Science and Technology and helped establish the state's Biotechnology Center.

Kim Kaplan (301) 344-3932

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## **USDA REVISES BLACK STEM RUST REGULATIONS**

WASHINGTON, Aug. 18—The U.S. Department of Agriculture will now allow some varieties of popular landscape plants in the barberry family to be transported without permits to areas that are not economically threatened by black stem rust, a serious fungal disease of small grains.

According to James W. Glosser, Administrator of USDA's Animal and Plant Health Inspection Service, major small grain areas are now 98-percent free of the disease-transmitting plant genera, which include Berberis, Mahoberberis and Mahonia. "These former 'eradication areas' will become 'protected areas' where APHIS will coordinate state regulatory actions to prevent the movement or entry of disease-transmitting plants," Glosser said.

Protected areas include the states of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, North Dakota, Ohio, Pennsylvania, South Dakota, West Virginia, Wisconsin and certain counties within Washington.

One of the most destructive small-grain diseases in the United States, black stem rust can only complete its life cycle by alternating between two sets of plants. It infects plants from the grass family including small grains such as wheat, oats, barley and rye. However, it reproduces on susceptible species of Berberis, Mahoberberis and Mahonia. Both sets of

plants are necessary for the disease to complete its life cycle.

In 1918, a cooperative federal-state program was begun to reduce black stem rust epidemics in states that grow small grains. The goals were to develop resistant grain-crop varieties, to eliminate susceptible *Berberis*, *Mahoberberis* and *Mahonia* in affected states, and to secure progress by regulating the interstate movement of these alternate hosts.

Eradication of these alternate hosts was achieved in 1981, and research has produced black stem rust resistance or near resistance in many commercial varieties of small grains. However, sexual recombination of the fungus on certain species of *Berberis*, *Mahoberberis* and *Mahonia* could undo this success by developing new, virulent strains of the fungus. Therefore, these plants will continue to be prohibited in areas where the disease has economic consequences, while commercial sales will be made easier in states where protection from black stem rust is unnecessary.

Ten comments were received following the proposal of these regulation changes on April 28. As a result of these comments, APHIS will publish a proposal to add the state of Wyoming to the list of protected areas.

Anita K. Brown (301) 436-5931

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## **USDA PERSONNEL PILOT PROJECT WOULD CUT HIRING RED TAPE**

**WASHINGTON**, Aug. 22—The U.S. Office of Personnel Management today called for public comments on a proposed demonstration project within the U.S. Department of Agriculture to test several innovations in federal recruitment and hiring practices.

Under a proposal to be published in the Aug. 23 Federal Register, more than 130 randomly selected sites within USDA's Agricultural Research Service and Forest Service would participate in the five-year project to implement experimental hiring and recruitment procedures designed to strengthen management's ability to recruit new employees and reduce delays in getting applicants hired.

"This initiative would continue to provide a quality workforce and would aid our agencies in more efficiently hiring qualified candidates for our positions," said John J. Franke, Jr., USDA's assistant secretary for administration. "The program is 'budget neutral' and, therefore, would be funded from existing appropriations."

"If the proposal is adopted, hiring under the demonstration project—which includes all occupational series in ARS and FS—could begin as early as May 1, 1990," Franke said. "Pennsylvania State University will monitor and evaluate the project throughout its life of five years. The pool of new hires in the project cannot exceed 5,000 at any one time," he said.

OPM will hold a public hearing in USDA's Jefferson Auditorium, 14th and Independence Avenue S.W., beginning at 10 a.m. on Oct. 18, to permit comment on the proposal. These comments will be considered in drafting the final provisions of the plan, which would be published at least 90 days before the demonstration project begins.

According to Franke, USDA and Office of Personnel Management officials have been working on the proposal for over a year. It would be the seventh of ten projects authorized by OPM under the Civil Service Reform Act of 1978. The projects are being implemented to see if a change in existing procedures would improve federal personnel management government-wide.

Innovations to be tested are:

- \* Grouping candidates for selection without numeric score by assessing their education, experience and ability. However, veterans will receive absolute hiring preference under the experimental system.

- \* Decentralization of the decision to authorize direct hire where shortages exist.

- \* Establishment of 3-year provisional appointments for scientists and 2-year appointments for all others before conversion to career status, in lieu of the present career conditional appointment process.

- \* Allowing managers to authorize recruitment incentives which might include cash bonuses and expanded reimbursement for relocation expenses.

Both ARS and FS would set up training sessions for those managers and personnelists involved with the pilot project.

The full text of the proposal will be published in the Aug. 23 Federal Register. Written comments on the plan must be received within 60 days of that publication; they should be submitted to Donna Beecher, U.S. Office of Personnel Management, 1900 E St., N.W., Washington, D.C. 20415.

Mary Ellen Recchia (202) 447-8580

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## USDA ANNOUNCES PREVAILING WORLD MARKET RICE PRICES

WASHINGTON, Aug. 22—Acting Under Secretary of Agriculture John Campbell today announced the prevailing world market prices of milled rice, loan rate basis, as follows:

- long grain whole kernels, 12.46 cents per pound;
- medium grain whole kernels, 11.23 cents per pound;
- short grain whole kernels, 11.11 cents per pound;
- broken kernels, 6.23 cents per pound.

Based upon these prevailing world market prices for milled rice, rough rice world prices are estimated to be:

- long grain, \$7.70 per hundredweight;
- medium grain, \$7.02 per hundredweight;
- short grain, \$6.78 per hundredweight.

The prices announced are effective today at 3 p.m. EDT. The next scheduled price announcement will be made Aug. 29, at 3 p.m. EDT, although prices may be announced sooner if warranted.

Gene Rosera (202) 447-7923

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## BUILT-IN THERMOSTAT COOLS, WARMS GLASS FABRICS, PAPER

WASHINGTON, Aug. 24—A "thermostat" for textiles also can keep glass fabrics and paper products cool or warm, according to U.S. Department of Agriculture studies.

USDA's Agricultural Research Service scientists said the patented process causes textiles to absorb or release heat as the temperature changes. A combination of durable-press resins and polyethylene glycols triggers the thermal reaction.

"We have been refining and testing the temperatures-sensitive process," said Tyrone L. Vigo, a chemist with the Southern Regional Research Center in New Orleans, where most of the ARS textiles research is done.

"To our surprise, it worked just as well for glass fabrics and paper products. It makes paper towels more absorbent and insulated containers work better, longer."

Vigo and colleague Joseph S. Bruno have been working four years on the thermal treatment they call polytherm.

How much heat a treated material will store and release depends on the kind of material, the chemical applied and the amount applied, Vigo said. "A 50-to-100-percent enhancement of heat absorption or release is probably a realistic goal."

He said the polyethylene glycols absorb large amounts of heat when they soften and release the heat when they solidify. That reaction occurs, he added, in glass fabric and paper products as well as in textiles.

Originally, Vigo and Bruno had visualized a range of potential textile applications—from workclothes and sportswear to carpets, draperies and upholstery.

"Over the past year," Vigo said, "we have received calls indicating that conventional textile use is just scratching the surface of possible applications."

At least 250 companies, trade associations, research institutes and entrepreneurs here and abroad have contacted Vigo in the last year. He has had over 800 inquiries since the research began.

Among the inquiries, he said, have been calls about using the thermal process for automotive fan belts and battery warmers, lint-free fabrics for biomedical uses, home attic insulation, tents, greenhouse coverings, intransit preserving of produce and military and fire-fighting protective clothing.

Vigo and Bruno said their laboratory research has shown that polytherm has other properties that also "are commercially attractive." Among them are high water absorbency, improved abrasion resistance, durable-press wear, antistatic cling and resistance to pilling of lintballs in polyester-blend fabrics.

Hank Becker (301) 344-3547

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# Backgrounder

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## USDA RECRUITMENT AND HIRING DEMONSTRATION PROJECT

### OVERVIEW

This project will test several experimental innovations in the federal recruitment and hiring system. Developed by the U.S. Department of Agriculture's Office of Personnel, Agricultural Research Service and Forest Service, with the participation and approval of the U.S. Office of Personnel Management, the new procedures will be implemented at approximately 130 randomly selected ARS and FS sites.

These alternative procedures will be used to hire new employees for permanent positions at the selected sites for a 5-year period. The procedures will apply to recruitment and hiring of candidates for all occupations, including clerical, administrative, technical, professional, scientific, managerial and wage grade.

The project is limited to a maximum of 5,000 employees at any one time. Approximately 75 control sites also have been identified for collection of comparative data. USDA managers and personnelists will receive extensive training to ensure that project changes are implemented consistently. The project was conceived in response to concern that the current federal recruitment and hiring system will face difficult challenges in the near future, including predicted shortages of qualified candidates and an increasing need for higher job skills. These and other challenges are detailed in the recent publications "Workforce 2000" and "Civil Service 2000," by the Hudson Institute (a non-profit research organization).

### PURPOSE

The project will develop an alternative system to enable federal managers to meet the challenges and evaluate the new procedures for possible implementation on a government-wide basis.

The goal of the project is to develop a recruitment and selection program for new hires that is flexible and responsive to local recruitment needs and will facilitate the attainment of a quality workforce, reflective

of society. The project also aims to increase the reliability of decisions to grant career tenure.

## **SPECIFIC CHANGES**

To accomplish these goals, the project will change current procedures as follows:

1. Decentralize the decision to authorize direct hire so that qualified candidates for positions identified as shortage categories, based on labor market considerations, may be directly hired without further evaluation.
2. Establish an alternative candidate assessment method which uses categorical grouping instead of numeric score so that all candidates not eligible for direct hire in shortage categories will be evaluated against the following job-related evaluation criteria:
  - a. Above Average Educational Achievement: This will be demonstrated by graduation from high school, an accredited junior college, college or other baccalaureate institution, with an overall GPA of 2.7, or a GPA in the major field of 3.0; college national honorary society membership; or completion of all requirements for an advanced degree, e.g., M.A., PhD., D.V.M., in a related field.
  - b. Quality Experience: To meet this criterion, the candidate must have demonstrated experience which is clearly beyond that required for basic eligibility and directly related to the position to be filled.
  - c. High Ability: This may be indicated by a certificate or other indicator of successful completion of a trade or vocational program directly related to the position opening; or by a GPA of 2.7 for 24 semester hours of directly related course work above the high school level. Candidates meeting any one of these criteria are in the "Quality Group," and selection will be made from this group. When an inadequate number of candidates is in the "Quality Group," all qualified candidates from all sources will be listed as a single group. Veterans will be given absolute preference over non-veterans.
3. Provide cash payments and reimbursement relocation travel and transportation expenses beyond current authorizations, as recruitment incentives to enhance an agency's ability to compete with other employers for qualified individuals. Reimbursements may be made for travel and transportation to first post of duty as currently authorized for transfers. Cash payments may be authorized for immediate, intermittent or deferred payment.
4. Make initial appointments on a provisional basis, with career tenure

earned through on-the-job performance. Provisional appointment is a permanent appointment to the competitive service, and will be three years for employees in scientific positions, and two years for all others. Provisional appointment replaces the current one-year probationary period. The purpose of provisional appointment is to provide managers with a more adequate period of time in which to make career tenure decisions. Exceptional performers may be converted to career tenure at an earlier date; however, provisional appointment in all cases must be at least one year. At the end of provisional appointment, the supervisor makes the decision either to convert the employee to career tenure, or to separate the employee under the same procedures currently utilized to separate probationary employees.

## **PROJECT EVALUATION**

Pennsylvania State University will evaluate the project to determine if changes occur as a result of the experimental recruitment and hiring program, basing findings on data collected from randomly selected experimental and comparison sites.

## **AUTHORIZATION**

The project is a research initiative authorized by Title VI of the Civil Service Reform Act, for the purpose of systematically evaluating the impact of innovations or experimental changes on federal personnel management policies and procedures. The project is the 7th of 10 such projects to receive OPM approval.

## **COMMENT PERIOD**

OPM will publish the project plan in the Aug. 23 Federal Register, allowing a 60-day comment period as well as providing notification of a public hearing scheduled for Oct. 18. A second notification containing the final project plan will be published in the Federal Register at least 90 days prior to the start of the project tentatively scheduled for June 1, 1990.

Mary Ellen Recchia (202) 447-8580

Issued: Aug. 22, 1989

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## ETHANOL'S ROLE IN CLEAN AIR

Citing numerous benefits of clean air, President Bush has submitted a proposal to Congress that attacks air pollution from several fronts while maintaining a reliance on market forces, where possible, to assure that pollution control measures are efficient.

The President's proposal calls for the use of oxygenated fuels, such as ethanol, in areas with serious carbon monoxide problems. The proposal also requires vehicle manufacturers to sell more than 9 million clean-fuel vehicles between 1995 and 2004. Clean fuels include methanol, ethanol, natural gas, propane, electricity and other power sources having comparably low emissions.

### SPECIFICS OF THE PROPOSAL

The Administration's Clean Air Act proposal (H.R. 3030) calls for the use of oxygenated fuels, such as ethanol, in areas with serious carbon monoxide emissions problems. The bill also grants ethanol blends an exemption from gasoline volatility standards so the blends can be sold during the summer without violating EPA standards. The bill does not mandate ethanol use; but, if EPA were to set oxygen standards high enough in carbon monoxide problem areas, ethanol blends may be the only fuels that would qualify.

The proposal also requires that vehicle manufacturers sell 500,000 clean-fuel vehicles in model year 1995, 750,000 in 1996 and 1 million per year between 1997 and 2004.

### THE ETHANOL INDUSTRY

The ethanol industry has experienced strong growth, progressing from only a token amount of production in 1979 to more than 825 million gallons in 1988. Ethanol blends containing 90 percent gasoline and 10 percent ethanol account for about 8 percent of U.S. gasoline sales—although in a few states they represent more than 25 percent of sales.

Ethanol has high octane. Its use can reduce carbon monoxide emissions and decrease carbon dioxide emissions. However, ethanol blends increase fuel volatility and can raise ozone levels. Some technical properties and its dependence on subsidies have limited ethanol use.

A recent development, ethyl tertiary butyl ether (ETBE), made from ethanol, offers considerable promise. ETBE has all of the desirable features of ethanol blends (e.g., high octane and low carbon monoxide pollution) but none of its undesirable technical properties, such as

intolerance of water (normally present in fuel systems) and higher fuel volatility. ETBE can be handled like any petroleum product and will be more readily accepted by oil and automobile companies, and by consumers. Ethanol reduces carbon monoxide pollution but may raise ozone levels while ETBE will reduce both. ETBE's improved properties increase the market value of ethanol, reducing its need for subsidies. ETBE needs further research and testing before entering commercial production, but it appears that ETBE can help ethanol make a significant contribution to cleaning up air pollution.

## AIR QUALITY

Carbon monoxide pollution is caused by incomplete combustion of fuels. Pollution levels are higher during winter months because engines take longer to warm up and also because more fuels are burned to heat buildings. The problem is more severe at higher elevations where the air contains less oxygen. Ethanol contains oxygen and, when added to gasoline, results in more complete combustion, reducing carbon monoxide emissions by 10 to 30 percent depending on the type of pollution controls installed on vehicles (older cars usually experience more benefit). For this reason, ethanol or other fuels containing oxygen, have been mandated by state or local authorities in regions with serious carbon monoxide emission problems. Arizona, Colorado, Nevada and New Mexico have imposed oxygenated fuels requirements during the winter for parts of those states. Ethanol can be used to meet these requirements, but more than 90 percent of the oxygenated fuels markets in those states has gone to MTBE (methyl tertiary butyl ether). MTBE is made from methanol and is fully compatible with existing gasoline distribution systems. ETBE could command a large share of those markets when it becomes available.

Reductions in carbon monoxide emissions depend on the amount of oxygen in the gasoline. Ethanol is about 35 percent oxygen compared with about 18 percent for MTBE and 16 percent for ETBE. When blended at the maximum rates presently permitted by EPA (10 percent, 15 percent and 12.7 percent, respectively), ethanol, MTBE and ETBE blends contain 3.7 percent, 2.7 percent and 2.0 percent oxygen, respectively.

Oxygenated fuels also increase aldehyde emissions. For example, gasoline containing 2 percent oxygen increases aldehyde emissions by 10 to 15 percent. Neat (pure) ethanol and methanol, which require engine

modifications, increase aldehyde emissions sharply. Oxygenated fuels also increase emissions of nitrogen oxide, an ozone precursor, by 4 to 10 percent.

Fuels with higher volatility, measured in pounds per square inch of Reid Vapor Pressure (RVP), have greater evaporation of volatile organic compounds (VOCs) which react to form ozone in the atmosphere. This is mainly a summer problem. Federal regulation restricts gasoline volatility in most regions during the summer months to 10.5 psi; blends containing ethanol are permitted to have a volatility 1.0 psi higher. This 1.0 psi waiver is necessary as ethanol, when blended with gasoline, raises the volatility of the resulting blend by up to 1.0 psi. H.R. 3030 would require even lower volatility, with fuels having an RVP of 9.0 psi or less beginning in 1992; it also includes a 1.0 psi waiver for ethanol blended fuels.

When ethanol is converted to ETBE and blended with gasoline, volatility is sharply reduced. This would permit oil companies to use additional amounts of volatile, relatively inexpensive petrochemicals like butane in gasoline and still meet reduced volatility standards.

Carbon dioxide, which is produced when a carbon-containing fuel is burned, is one of the principal greenhouse gases—the culprits in global climate change. When ethanol is substituted for fossil fuels, the CO<sub>2</sub> released is recaptured during growth of the biomass feedstock. However, because some 75,000 to 95,000 Btu of fossil fuel energy (mostly coal) generally is used as an energy source to produce a gallon of ethanol and byproducts containing about 128,000 Btu of energy, ethanol production adds more CO<sub>2</sub> to the atmosphere than is recycled in the biomass-to-ethanol process. But, the biomass-to-ethanol process contributes less CO<sub>2</sub> per gallon of fuel than its gasoline equivalent.

## SUBSIDIES

With current technology, ethanol cannot be produced inexpensively enough to compete with gasoline or petroleum-based octane enhancers such as MTBE without subsidies. However, its air quality and other benefits may warrant continued subsidization until lower costs and higher oil prices enable ethanol to compete on its own.

It presently costs about 85 cents to \$1.50 per gallon to produce ethanol from corn depending on the age, type and size of plant, and feedstock prices. Oil prices would need to exceed \$40 per barrel for ethanol to compete without subsidies; oil now costs less than \$20 per barrel and is

not expected to hit the \$40 mark during this century. Currently, through a tax exemption, the direct federal subsidy to ethanol is 60 cents per gallon. About 20 states provide additional direct subsidies averaging about 20 to 30 cents per gallon. Various indirect subsidies, such as loan guarantees, also have been available for the past decade. Total federal and state subsidy costs (excluding the cost of loan guarantees) for ethanol produced since 1979 are about \$4.2 billion, or about \$1 per gallon produced since that time. (Table 1.)

The direct federal subsidy, which expires in 1993, reduces receipts of the Highway Trust Fund, which is responsible for the construction and maintenance of the Interstate Highway System. Between 1986 and 1988, the subsidy reduced the money available in the trust fund by 2.5 percent. Per gallon subsidy needs will be reduced if ethanol is made into ethyl tertiary butyl ether (ETBE). A subsidy will still be required for ETBE to compete with other octane enhancers, but it appears that the federal subsidy alone will be sufficient. Ethanol, as ETBE, will then be able to penetrate national fuel markets. Most ethanol presently is sold in states that offer additional subsidies. Commercial ETBE production could be accelerated by research on the product and engine tests and by extending the tax credit to the ethanol used in making ETBE.

## ETHANOL PRODUCTION

About 95 percent of the ethanol produced in the United States is made from corn (about 325 million bushels last year), although it can be made from any feedstock containing starch or fermentable sugar. About 80 percent is produced at 13 plants located in the Corn Belt. A total of 53 plants were operating at the beginning of the year. No new plants are being built because investments cannot be recovered before the ethanol tax incentive expiration date in 1993.

Corn is the preferred feedstock because it is readily available; it stores well, facilitating year-round production; and it costs less than most other potential feedstocks. About 2.5 gallons of ethanol are produced from one bushel of corn. Cellulosic materials, such as wood and crop residues, may be used as a feedstock, but low alcohol yields and higher production costs have discouraged their use. New technologies may make the use of cellulosic feedstocks economical in the future.

Ethanol production from corn yields byproducts including (depending on the production method used) distillers dried grains (DDG), corn gluten feed (CGF), corn gluten meal (CGM), corn oil and carbon dioxide.

DDG, CGF AND CGM are marketed as high-protein animal feeds which can substitute for soybean meal, cottonseed meal, and other protein sources. Carbon dioxide may be marketed for food or industrial uses or vented to the atmosphere (not a sound environmental practice).

Income from the sale of the byproducts is critical to the economics of ethanol production. If ethanol production is expanded, it is uncertain how much byproduct feed prices would fall for markets to absorb additional supplies. New byproduct markets likely would be needed, perhaps by expanding U.S. and foreign feed markets or developing new food uses.

## **AGRICULTURAL IMPLICATIONS OF ETHANOL**

Expanded ethanol production would have numerous implications for agriculture, including increasing corn prices and production. Each one-billion-gallon increase in ethanol production would consume about 400 million bushels of corn (about 5 percent of a normal year's crop). Increased production of ethanol byproduct feeds would lower byproduct prices and the prices and production of soybeans and other protein feeds. Increased corn prices and the reduction in protein-feed prices would be moderated as farmers shift acreage from soybeans and other crops to corn. For increases in ethanol production up to about 3 billion gallons per year, each additional 1 billion gallons would increase corn prices by some 8 to 28 cents per bushel. U.S. net farm income would increase.

The effects of expanded ethanol production would vary among farmers. Corn growers would see higher incomes while soybean producers would be hurt by competition from byproducts. Livestock producers who feed corn would find their costs of production increased, while those who use byproduct feeds would enjoy lower costs.

The effects on agriculture are expected to be relatively small unless there is a sharp increase in ethanol production. Higher corn prices likely would reduce agricultural program costs. Actual savings would depend on market conditions and specific provisions of the farm program.

When market prices for corn are below target price support levels, increases in ethanol production have little effect on net farm income, but they shift the source of farm income from government payments to market receipts. Agricultural program costs are reduced. When market prices exceed target prices, increases in ethanol production result in larger increases in farm income but little savings in agricultural program costs. As long as land is idled by farm programs, additional ethanol production can be expected to reduce agricultural program costs but have

little effect on farm income.

Increases in ethanol production exceeding 4 to 5 times current levels would begin to tax agricultural resources and place strong upward pressure on grain prices, thereby increasing the cost of ethanol and food. Large increases in ethanol production also would increase U.S. food and fuel vulnerability to possible crop failures unless processes are developed for economical production of ethanol from cellulose (expected after the turn of the century).

## TRADE

Both ethanol and its byproducts are traded in international commerce. Ethanol imports are subject to a 60 cents per gallon duty to offset the equivalent federal subsidy to the domestic industry. The duty does not apply to most ethanol imported from countries covered by the Caribbean Basin Economic Recovery Act. Most of the ethanol produced in the Caribbean is made by merely distilling inexpensive surplus wine ethanol imported from Europe.

If the present ethanol subsidy is extended to ethanol used in the manufacture of ETBE, ETBE is likely to be imported unless an offsetting import tariff is imposed.

Ethanol byproduct feed, principally corn gluten feed, is exported, mainly to Europe. Ethanol producers would look to Europe and other overseas markets to absorb additional quantities of byproduct feeds if ethanol production increased. The markets could be strained unless new sources of demand are found.

## RESEARCH

USDA has been involved in alcohol fuels research and development for many years. After the 1973-74 Arab oil embargo, USDA established a major initiative in alcohol fuels and conducted more than \$40 million of R&D on ethanol fuels. Efforts were made to improve the processing technology developed in the 1930s, which served as the base for our current ethanol industry. Significant progress was made in developing more effective fermentation and distillation processes and improved feedstock varieties were developed.

In the mid-1980s, with plentiful supplies of fuel at declining prices, ethanol research funds were redirected to other activities. Annual funding dropped to less than \$1 million for ethanol. Today it remains at a similar level.

Given the new concern over air pollution and global climate change,

there is renewed emphasis to use ethanol and other biomass fuels instead of fossil fuels. The challenge to USDA is how to improve the economics of ethanol production and use. Some of the areas our scientists believe they can improve are:

- Increase ethanol yields.
- Reduce fermentation time.
- Develop a continuous fermentation process.
- Improve membrane distillation technology.
- Reduce energy required to produce ethanol.
- Develop crops with higher fermentable sugar content.
- Develop processes for efficient production of ethanol from cellulose.
- Develop new uses for ethanol byproducts.
- Improve engines that use higher percentages of ethanol in fuel blends.
- Reduce harmful nitrous oxide and aldehyde emissions.
- Improve the efficiency of ETBE production.

Another promising avenue for research is the use of byproducts in human food. This could be an important nutrition source both in the United States and in regions of the world where adequate protein is not always available. Research also is needed to determine how much additional protein feed could be used in livestock and poultry rations.

Ethanol already plays an important part in meeting U.S. fuel needs. Ethanol's contribution will grow through our efforts to improve air quality and with the commercial development of ETBE. Large-scale substitution of ethanol for gasoline, however, likely will depend on future improvements in ethanol production technology.

## **BENEFITS OF ETHANOL FUELS**

- Increases gasoline octane ratings.
- Reduces carbon monoxide emissions.
- Benefits corn producers.
- Benefits livestock farmers who use high-protein feeds.
- Raises net farm income.
- Contributes to rural employment.
- Reduces agricultural program costs.
- Reduces dependence on petroleum.

## **DISADVANTAGES OF ETHANOL FUELS**

- Potentially increases ozone pollution (unless made into ETBE).
- Harms the soybean and other protein-feed industries.

- Harms livestock producers who must feed corn.
- Contributes to higher consumer food costs.
- Causes trade frictions with Europe, Brazil and Caribbean countries.
- Harms the petroleum industry.
- Will require subsidies for many more years.
- Subsidies reduce the tax revenues and highway trust fund.

**Table 1. Estimated ethanol industry tax expenditures**

Calendar Year	New Capacity	Domestic Production	EITC <sup>1</sup>	Subsidy Direct	Total
		Energy Volume Million gallons	1015 Btu <sup>2</sup>	Federal	State
-----Million dollars-----					
1979	60	20	0.002	9.6	0
1980	120	40	.003	19.2	32.0
1981	200	75	.006	32.0	34.0
1982	215	210	.016	34.4	63.6
1983	105	375	.029	16.8	210.0
1984	140	430	.033	22.4	284.0
1985	40	625	.048	6.4	476.0
1986	220	750	.057	52.8	480.0
1987	100	825	.063	0 <sup>3</sup>	495.0
1988	0	825	.063	0 <sup>3</sup>	497.3
Total	1,200	4,175	.320	193.6	2,571.9
				1,433.4	4,198.9

<sup>1</sup>Energy Investment Tax Credit. The table assumes the credits were taken in the year the investment was made. In fact, credits could be carried forward over a period of years (those remaining after 1986 were reduced by 35 percent). Therefore, the values reported here for any given year could vary from the amount actually claimed. The total amount claimed over the 1979-88 period is not likely to be affected since claims would have fallen sharply after 1986.

<sup>2</sup>1 gallon of ethanol contains 76,000 Btu.

<sup>3</sup>EITC expired in 1986. While credits were available for some subsequent investments already under binding contracts, the amount of investment eligible for EITC after 1986 likely was small.

SOURCE: Capacity, production and subsidy data 1979-1986 from USDA, Economic Research Service, "Ethanol: Economics and Policy Tradeoffs", January 1988, (AER-585).

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